DETAILED ACTION

Priority

1. Receipt is acknowledged of papers submitted under 35 U.S.C. 119(a)-(d), which papers have been placed of record in the file.

Drawings

2. The drawings have not been checked to the extent necessary to determine the presence of all possible minor errors. Applicant's cooperation is requested in correcting any errors of which applicant may become aware in the figures.

Specification

3. The specification has not been checked to the extent necessary to determine the presence of all possible minor errors. Applicant's cooperation is requested in correcting any errors of which applicant may become aware in the specification.

Claim Rejections - 35 USC § 112

4. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

5. Claims 1, 2, 9, 10, and 12 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

6. Claim 1 is rejected under 35 U.S.C. 112, second paragraph, as being incomplete for omitting essential structural cooperative relationships of elements, such omission amounting to a gap between the necessary structural connections. See MPEP § 2172.01.

An omitted structural cooperative relationship results from the claimed subject matter: "*connecting a plurality of thin film transistors arranged along a first direction to* ***a plurality of data lines in an offset configuration between adjacent data lines***" (in line 4).

It would be unclear to one having ordinary skill in the art what relationship, if any, exists between the "***plurality of data lines***" and "***adjacent data lines***". For example: Are the "***adjacent data lines***" common/identical to the earlier claimed "***plurality of data lines***"? Or are the "***adjacent data lines***" distinct and different from the earlier claimed "***plurality of data lines***"?

It would be unclear to one having ordinary skill in the art what the claimed term "***in an offset configuration***" is intended to refer to. For example: Are the data lines "***in an offset configuration***"? Or are the thin film transistors "***in an offset configuration***"? And what exactly is this "***offset***" relative to?

An omitted structural cooperative relationship results from the claimed subject matter: "***a turn-ON voltage***" (in line 5); "***a threshold voltage***" (in line 5); "***voltages***" (in line 9); "***a voltage***" (in line 10); and "***the voltage***" (in line 12). It would be unclear to one having ordinary skill in the art what relationship, if any, exists between all the claimed "***voltage(s)***" limitations. For example: Is the "***turn-ON voltage***" common/identical to the later claimed "***voltages***"? Or is he "***turn-ON voltage***" distinct and different from the later claimed "***voltages***"?

An omitted structural cooperative relationship results from the claimed subject matter: "***an electric field alignment***" (in line 6); "***electric field alignment***" (in line 9); and "***the electric field alignment***" (in line 10). It would be unclear to one having ordinary skill in the art what relationship, if any, exists between all the claimed "***electric field alignment***" limitations. For example: Is a single, identical "***electric field alignment***" being claimed? Or are plural distinct and different "***electric field alignments***" being claimed?

An omitted structural cooperative relationship results from the claimed subject matter: "*the voltages for the electric field alignment* ***being changed from electric field alignment data signals*** *and* ***being analog gamma voltages***" (in line 12).

It would be unclear to one having ordinary skill in the art whether or not "***electric field alignment data signals***" are part of the claimed invention. How is a "***voltage***" changed from a "***signal***"? A "***voltage***" is inherently a "***signal***", isn't it? Furthermore, there's no antecedent basis whatsoever for "***electric field alignment data signals***". Lacking any antecedent basis for "***electric field alignment data signals***" in the claim; it would be unclear to an artisan how any "***voltage***" change can take transpire.

It would be unclear to one having ordinary skill in the art what the claimed term "***being analog gamma voltages***" is intended to refer to. For example: Are the data signals "***being analog gamma voltages***"? Or are the voltages "***being analog gamma voltages***"?

7. Claim 1 recites the limitations: "***an offset configuration***" (in line 4); "***opposite polarity***" (in line 9); and "***electric field alignment data signals***" (in line 12). There is insufficient antecedent basis for these limitations in the claim.

8. The term "***Half V-Switching Mode***" (in claim 2, line 2) is a relative term which renders the claim indefinite. The term "***Half V-Switching Mode***" is not defined by the claim, the specification does not provide a standard for ascertaining the requisite degree, and one of ordinary skill in the art would not be reasonably apprised of the scope of the invention. For example: The variable "***V***" has nowhere been defined in the claim. Does the variable "***V***" stand for "vertical"? Or does the variable "***V***" stand for "roman numeral five"?

9. Claim 9 is rejected under 35 U.S.C. 112, second paragraph, as being incomplete for omitting essential structural cooperative relationships of elements, such omission amounting to a gap between the necessary structural connections. See MPEP § 2172.01.

An omitted structural cooperative relationship results from the claimed subject matter: "*a plurality of* **data** *and gate lines*" (in line 2).

It would be unclear to one having ordinary skill in the art whether a single element of "data" is being claimed; or whether plural elements of "data" are being claimed; or whether a single "data line" is being claimed; or whether a plural "data lines" are being claimed.

An omitted structural cooperative relationship results from the claimed subject matter: "*a liquid crystal panel having a plurality of data and gate lines and a plurality of thin film transistors* ***arranged in an offset configuration between adjacent data lines***" (in line 2).

It would be unclear to one having ordinary skill in the art what relationship, if any, exists between the "***plurality of data and gate lines***" and "***adjacent data lines***". For example: Are the "***adjacent data lines***" common/identical to the earlier claimed "***plurality of data and gate lines***"?

Or are the "***adjacent data lines***" distinct and different from the earlier claimed "***plurality of data and gate lines***"?

It would be unclear to one having ordinary skill in the art what the claimed term "***in an offset configuration***" is intended to refer to. For example: Are the gate lines "***in an offset configuration***"? Or are the thin film transistors "***in an offset configuration***"? And what exactly is this "***offset***" relative to?

An omitted structural cooperative relationship results from the claimed subject matter: "***a turn-ON voltage***" (in line 4); "***a threshold voltage***" (in line 5); "***opposite polarity voltages***" (in line 7); "***a voltage***" (in line 9); and "***the voltages***" (in line 10). It would be unclear to one having ordinary skill in the art what relationship, if any, exists between all the claimed "***voltage(s)***" limitations. For example: Is the "***turn-ON voltage***" common/identical to the later claimed "***voltages***"? Or is he "***turn-ON voltage***" distinct and different from the later claimed "***voltages***"?

An omitted structural cooperative relationship results from the claimed subject matter: "***an electric field alignment***" (in line 6); "***electric field alignment***" (in line 7); and "***the electric field alignment***" (in line 8). It would be unclear to one having ordinary skill in the art what relationship, if any, exists between all the claimed "***electric field alignment***" limitations. For example: Is a single, identical "***electric field alignment***" being claimed? Or are plural distinct and different "***electric field alignments***" being claimed?

An omitted structural cooperative relationship results from the claimed subject matter: "*the voltages for the electric field alignment* ***being changed from electric field alignment data signals*** *and* ***being analog gamma voltages***" (in line 12).

It would be unclear to one having ordinary skill in the art whether or not "***electric field alignment data signals***" are part of the claimed invention. How is a "***voltage***" changed from a "***signal***"? A "***voltage***" is inherently a "***signal***", isn't it? Furthermore, there's no antecedent basis whatsoever for "***electric field alignment data signals***". Lacking any antecedent basis for "***electric field alignment data signals***" in the claim; it would be unclear to an artisan how any "***voltage***" change can take transpire.

It would be unclear to one having ordinary skill in the art what the claimed term "***being analog gamma voltages***" is intended to refer to. For example: Are the data signals "***being analog gamma voltages***"? Or are the voltages "***being analog gamma voltages***"?

10. Claim 9 recites the limitations: "***an offset configuration***" (in line 3); "***opposite polarity voltages***" (in line 7); "***electric field alignment data signals***" (in line 10); and "***the ferroelectric liquid crystal cell***" (in line 12). There is insufficient antecedent basis for these limitations in the claim.

11. The term "***Half V-Switching Mode***" (in claim 10, line 2) is a relative term which renders the claim indefinite. The term "***Half V-Switching Mode***" is not defined by the claim, the specification does not provide a standard for ascertaining the requisite degree, and one of ordinary skill in the art would not be reasonably apprised of the scope of the invention. For example: The variable "***V***" has nowhere been defined in the claim. Does the variable "***V***" stand for "vertical"? Or does the variable "***V***" stand for "roman numeral five"?

12. Claim 12 recites the limitation "***video data***" (in line 2). The lack of a grammatical article (such as "***a***" or "***a plurality of***" or "***the***" or "***said***") preceding the limitation renders it unclear whether the claim is establishing a new element; or instead referring back to some preestablished limitation. For example, it would be unclear to an artisan whether a single element of "***data***" is being claimed; or rather whether a plurality of "***data***" elements are being claimed.

13. Claim 12 recites the limitations: "***different polarities***" (in line 2); and "***during driving***" (in line 3). There is insufficient antecedent basis for these limitations in the claim.

Claim Rejections - 35 USC § 103

14. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

15. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

16. Claims 1, 2, 9, 10, and 12 are rejected under 35 U.S.C. 103(a) as being unpatentable over ***Yasuda et al (US 4,842,371 A)*** in view of ***Saishu et al (US 5,949,391 A)***.

Regarding claim 1, ***Yasuda*** discloses an electric field alignment method of a twisted nematic liquid crystal display device (see Column 22, Lines 17-21), comprising:

connecting a plurality of thin film transistors [Fig. 1; T_{11}-T_{44}] arranged along a first direction to a plurality of data lines [Fig. 1; S_1-S_8] in an offset configuration between adjacent data lines (see Column 6, Line 54 - Column 7, Line 40);

supplying a turn-ON voltage [Fig. 4; b & c] at a level greater than a threshold voltage of the thin film transistors during an electric field alignment of liquid crystal material [Fig. 1; driving liquid crystal cells C11-C14, C21-C24, C31-C34, C41-C44 via Fig. 4; e-j] of the liquid crystal display device to a plurality of gate lines [Fig. 1; G_1 & G_2] arranged along a second direction; and

supplying voltages [Fig. 4; d] for electric field alignment and of opposite polarity [Fig. 4; + and -] to the adjacent data lines [Fig. 1; S_1-S_8] during the electric field alignment while constantly maintaining a voltage [Fig. 4; e-j] of a liquid crystal cell [Fig. 1; C11-C14, C21-C24, C31-C34, C41-C44 between 2 & 3] of the liquid crystal display device during the electric field alignment (see Column 8, Line 67 - Column 9, Line 49),

the voltages for the electric field alignment being changed [Fig. 2; via 124 & 125] from electric field alignment data signals [Fig. 2; VR, VG, VB output by 114] and being analog gamma voltages [Fig. 2; Ro, Go, Bo, Re, Ge, Be],

wherein an electric field [Fig. 4; e-j] is applied to the liquid crystal cell by using a leakage current of the thin film transistors [Fig. 1; T_{11}-T_{44}] (see Column 12, Lines 42-56), and

wherein the turn-ON voltage is supplied to each of the gate lines in a range between ten to four-hundred times during the electric field alignment (see Fig. 10; Column 11, Lines 54-62).

For instance, during ten to four-hundred frames [Fig. 4; each frame being 1/60 of a second long], each voltage [Fig. 4; e-j] of the corresponding liquid crystal cells [Fig. 1; C11-C14, C21-C24, C31-C34, C41-C44] of the liquid crystal display device is maintained [continues to exist, does not turn off], as instantly claimed.

As such, one having ordinary skill in the art would recognize that the turn-ON voltage is supplied ten to four-hundred separate times during the electric field alignment of ten to four-hundred consecutive frames.

Yasuda does not expressly disclose the twisted nematic liquid crystal display could also be a ferroelectric liquid crystal display.

However, ***Saishu*** does disclose using ferroelectric liquid crystal in place of twisted nematic liquid crystal (see Column 1, Lines 20-32).

Yasuda and ***Saishu*** are analogous art, because they are from the shared field of driving thin film transistors in an offset configuration for liquid crystal display devices.

Therefore, it would have been obvious to one of ordinary skill in the art at the time of invention to replace ***Yasuda's*** twisted nematic liquid crystal with ***Saishu's*** ferroelectric liquid crystal, so as to improve display response speed and viewing angle.

Regarding claim 2, ***Yasuda*** discloses the liquid crystal cell operates in a Half V-Switching Mode (see Fig. 13; Column 15, Lines 3-12).

Regarding claim 9, this claim is rejected by the reasoning applied in rejecting claim 1; furthermore, ***Yasuda*** discloses a gate driving circuit [Fig. 1; G_1 & G_2] and a data driving circuit [Fig. 1; 111 & 112] (see Column 6, Line 54 - Column 7, Line 40).

Regarding claim 10, this claim is rejected by the reasoning applied in rejecting claim 2.

Regarding claim 12, ***Yasuda*** discloses the data driving circuit supplies video data [Fig. 4; d] having different polarities to the adjacent data lines during driving of the display device (see Column 8, Line 67 - Column 9, Line 49).

Response to Arguments

17. Applicant's arguments filed 27 March 2008 have been fully considered but they are not persuasive.

The Applicant contends, "*Yasuda et al. (Col. 9, Lines 5-7) merely discloses that waveform (b) and (c) represents scanning signals applied respectively to the first and second control lines G1 and G2. In Yasuda et al., first scanning signal (Fig. 4 (b)) is applied to first control line G1, and then, second scanning signal (Fig. 4 (c)) is applied to second control signal*

G2. Accordingly to such disclosure in Yasuda et al., Applicants respectfully submit that one control signal is applied to each control line one time in Yasuda et al.

"Moreover, one control signal of Yasuda et al. is applied to one control line only one horizontal period. In contrast, the turn-ON voltage of the present invention is supplied to each of the gate lines in a range of from ten to four-hundred times during the electric field alignment. Hereinafter, 'during the electric field alignment' means period for aligning ferroelectric liquid crystal material using electric field. Thus, the 'during electric field alignment' of the present invention is completely different from horizontal period of Yasuda et al." (see Page 9, Paragraphs 1-2 of the Response filed 27 March 2008). However, the examiner respectfully disagrees.

The Applicant states above, " ***'during the electric field alignment'*** *means period for aligning ferroelectric liquid crystal material using electric field."*

Although the Applicant's above definition for what is meant by ***"during the electric field alignment"*** *has nowhere been instantly claimed;* ***Yasuda*** discloses supplying a turn-ON voltage [Fig. 4; b & c] at a level greater than a threshold voltage of a plurality of thin film transistors [Fig. 1; T_{11}-T_{44}] during an electric field alignment of liquid crystal material [Fig. 1; driving liquid crystal cells C11-C14, C21-C24, C31-C34, C41-C44 via Fig. 4; e-j] of the liquid crystal display device (see Column 22, Lines 17-21) to a plurality of gate lines [Fig. 1; G_1 & G_2].

Because present claim language nowhere provides any metes or boundaries on what is meant by ***"during the electric field alignment"***; one having ordinary skill in the art would

appreciate that electric field alignment occurs whenever and so long as ***Yasuda's*** LCD cells/pixels [Fig. 1; C11-C14, C21-C24, C31-C34, C41-C44] are driven via image data signals.

The Applicant contends the instantly claimed invention distinguishes over the prior art, because ***Yasuda's*** turn-ON voltage [Fig. 4; b & c] is supplied to each of the gate lines [Fig. 1; G_1 & G_2] only once during the electric field alignment. Here the Applicant presumes the undefined "*electric field alignment period*" must be limited to just one image frame lasting a single 1/60 of a second (see ***Yasuda's*** 60Hz frequency in Figure 4). However, the examiner respectfully disagrees with the Applicant's presumption.

For instance, during ten to four-hundred frames [Fig. 4; each frame being 1/60 of a second long] of operation, each voltage [Fig. 4; e-j] of the corresponding liquid crystal cells [Fig. 1; C11-C14, C21-C24, C31-C34, C41-C44] of ***Yasuda's*** liquid crystal display device is maintained [continues to exist, does not turn off], as instantly claimed.

As such, one having ordinary skill in the art would recognize that the turn-ON voltage is supplied ten to four-hundred separate times during the electric field alignment of ten to four-hundred consecutive frames.

The Applicant also contends, "*Furthermore, in Yasuda et al., analog signals Ro, Go, Bo, Re, Ge and Be applied to source lines are changed from digital signals VR, VG and VB for displaying factual image. In the present invention, analog signals Ro, Go, Bo, Re, Ge and Be of Yasuda et al. are disclosed. In other words, analog signals Ro, Go, Bo, Re, Ge and Be of Yasuda*

et al. correspond to R, G and B video data of the present invention. However, the present invention discloses voltage for electric field alignment completely different from R, G and B video data. The voltages for electric field alignment are changed from electric field alignment data signals, and are used for aligning ferroelectric liquid crystal material, not used for displaying factual image" (see Page 9, Paragraphs 1-2 of the Response filed 27 March 2008). However, the examiner respectfully disagrees.

In response to applicant's argument that the references fail to show certain features of applicant's invention, it is noted that the features upon which applicant relies (i.e., *The voltages for electric field alignment are changed from electric field alignment data signals, and are used for aligning ferroelectric liquid crystal material, not used for displaying factual image*) are not recited in the rejected claim(s). Although the claims are interpreted in light of the specification, limitations from the specification are not read into the claims. See *In re Van Geuns*, 988 F.2d 1181, 26 USPQ2d 1057 (Fed. Cir. 1993).

Applicant's arguments with respect to claims 1, 2, 9, 10, and 12 have been considered but are moot in view of the new ground(s) of rejection.

By such reasoning, rejection of the claims is deemed necessary, proper, and thereby maintained at this time.

Conclusion

18. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jeff Piziali whose telephone number is (571) 272-7678. The examiner can normally be reached on Monday - Friday (6:30AM - 3PM).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Bipin Shalwala can be reached on (571) 272-7681. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Jeff Piziali/
Primary Examiner, Art Unit 2629
11 June 2008